

CLAIMS

1. Temperature monitoring device of a matter that is at least partly of water, such as food, comprising a wireless temperature sensor comprising:

- a temperature transducer of the said matter;
- 5       • an electromagnetic wave transmitter circuit electrically connected to the temperature transducer, comprising a converter of electric signals coming from the transducer to electromagnetic type signals;
- a hermetic and highly thermal conductive case
- 10 designed to be fitted with all of the electric system comprising the temperature transducer and the transmitter circuit;

wherein the sensor is laid out so that the temperature transducer is located near to the transmitter circuit, thereby forming a compact unit.

2. Device according to the previous claim, wherein the sensor further comprises an electric power supply for the whole sensor that operates autonomously, such as an electric cell or a rechargeable battery, placed inside

20 the case.

3. Device according to the previous claim, wherein the power supply is near to the transducer and the transmitter circuit, thereby forming a compact unit.

4. Device according to claim 2, wherein the power supply is distant from the transmitter and the transducer so that it remains outside the food when the sensor is inserted into the food.

5. Device according to the previous claim, wherein the power supply is protected against heat by a cover of

thermal insulating material, thus forming a thermal shield.

6. Device according to the previous claim, wherein the cover is of silicone.

5        7. Device according to one of the five previous claims, wherein the autonomous power supply of the sensor can operate up to temperatures of approximately 130°C (266°F).

10       8. Device according to one of the six previous claims, wherein the autonomous power supply of the sensor can operate from temperatures of approximately -40°C (-40°F).

15       9. Device according to one of the seven previous claims, wherein the autonomous power supply of the sensor is a non-saline and non-alkaline electric cell.

10. Device according to one of the eight previous claims, wherein the autonomous power supply of the sensor is a thionyl lithium electric cell.

20       11. Device according to one of the nine previous claims, wherein the case is electrically conductive, and wherein the sensor further comprises means for switching-off electric power supplied by the power supply source when the sensor is not in contact with the said matter, the power supply switch-off means being sensitive to the  
25       conductivity of the said matter.

12. Device according to one of the previous claims, wherein the transmitter circuit transmits the electromagnetic waves by bursts.

30       13. Device according to one of the previous claims, wherein the hermetic case is of a single piece.

14. Device according to one of the claims 1 to 12, wherein that the case is made of several fitted pieces that can be disassembled.

15 15. Device according to the previous claim, wherein assembly means for assembling of two pieces of the hermetic case are metallic and create an electric contact for the operating of the sensor.

16. Device according to one of the previous claims, wherein the case is laid out so as to facilitate the  
10 insertion of the sensor into the said matter.

17. Device according to one of the previous claims, wherein the sensor further comprises an electromagnetic wave transmitting aerial laid out so as to further constitute means of gripping.

15 18. Device according to the previous claim, wherein the aerial is covered with an electrical insulating material.

19. Device according to the previous claim, wherein the aerial is covered with silicone foam.

20 20. Device according to one of the previous claims, further comprising a control unit controlling the thermal data transmitted from the sensor by electromagnetic way, this control unit comprising:

- a receiver for the type of electromagnetic waves  
25 transmitted by the sensor;

- a micro-controller capable of controlling the thermal data in electromagnetic form received from the sensor by the receiver, and of transmitting at least a part of it to a user interface;

30 • the user interface comprising transmission means of the thermal data in a form understandable to the user of the device.

21. Device according to the previous claim, wherein the control unit further comprises a memory capable of storing thermal data and wherein the micro-controller is capable of processing the thermal data received from the sensor in accordance with this thermal data.

22. Device according to the previous claim, wherein the user interface comprises an alarm, wherein thermal data stored in the memory corresponds to a temperature threshold, and in that the micro-controller triggers the alarm if the temperature detected by the sensor is greater than the temperature threshold.

23. Device according to one of the two previous claims, wherein the user interface comprises means that allow the user to input the data in to the memory.

24. Device according to one of the four previous claims, wherein the user interface comprises an alarm, and wherein the micro-controller triggers the alarm if it does not receive any electromagnetic waves over a pre-set duration or if it does not receive one or several thermal informations that it should have received.

25. Temperature monitoring process for a matter that is at least partly of water, such as food, the matter having a temperature less than approximately 130°C (266°F), activating the temperature monitoring device according to one of the previous claims, wherein the wireless part of the temperature sensor comprising the transducer and the transmitter circuit is inserted into the said matter.

26. Process according to the previous claim, wherein the part of the sensor comprising the power supply is also inserted into the said matter.